

IN THE CLAIMS

The claims are as follows:

1. (Previously Presented) A method including:
sensing, in a subject, a condition correlative to edema; and
initiating/adjusting, in response to the sensing, at least one of a cardiac resynchronization therapy that coordinates a spatial nature of a depolarization associated with a heart contraction in at least one heart chamber and a cardiac contractility modulation therapy that includes delivering electrical energy to a portion of a heart during a refractory time period of the portion of the heart.
2. (Original) The method of claim 1, in which the sensing includes detecting a change in a baseline thoracic impedance associated with fluid buildup in a portion of a thorax of the subject.
3. (Original) The method of claim 2, in which the sensing includes detecting a decrease in the baseline thoracic impedance associated with fluid buildup in the portion of the thorax of the subject.
4. (Original) The method of claim 3, in which the baseline portion of the thoracic impedance is less than or equal to a cutoff frequency value that is between 0.01 Hz and 0.5 Hz inclusive.
5. (Original) The method of claim 4, in which the cutoff frequency value is approximately 0.1 Hz.
6. (Original) The method of claim 2, in which the sensing also includes detecting an increase in a rate of breathing of the subject.
7. (Original) The method of claim 6, in which the detecting the increase in the breathing rate includes sensing the breathing of the subject from a portion of the thoracic impedance that is approximately between 0.05 Hz and 2.0 Hz inclusive.

8. (Original) The method of claim 1, in which the initiating/adjusting the cardiac resynchronization therapy includes selecting an interelectrode delay value, for subsequent delivery of contraction-evoking stimulations occurring during a single cardiac cycle.

9. (Original) The method of claim 1, in which the initiating/adjusting the cardiac resynchronization therapy includes selecting at least one particular electrode, from a plurality of electrodes differently located in association with a heart of the subject, for subsequent delivery of a contraction-evoking stimulation.

10. (Original) The method of claim 9, in which selecting the interelectrode delay value includes selecting at least one of an atrioventricular delay value, an interventricular delay value, and an intraventricular delay value.

11. (Original) The method of claim 9, in which the selecting the particular electrode includes selecting the particular electrode from a plurality of same-chamber electrodes differently located in association with a single chamber of the subject's heart.

12. (Original) The method of claim 9, in which the selecting the particular electrode includes selecting the particular electrode from a plurality of electrodes, at least two of which are located in association with different chambers of the subject's heart.

13. (Original) The method of claim 1, in which the initiating/adjusting the cardiac contractility modulation therapy includes providing a non-contraction-evoking stimulus to a location of a heart of the subject during a refractory period of the heart location.

14. (Original) The method of claim 13, in which the refractory period follows a paced or sensed contraction of the heart location.

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- 15. (Previously Presented)** A cardiac rhythm management system including:
- an edema detection circuit to sense a condition correlative to edema in a subject;
 - an electrical energy delivery circuit to deliver electrical energy to the subject; and
 - a controller circuit, coupled to the edema detection circuit to receive a detected edema indicator, and coupled to the energy delivery circuit to provide a control signal for timing delivery of the electrical energy to the subject, the controller including a cardiac resynchronization therapy parameter and a cardiac contractility modulation therapy mode, and in which the controller is configured to initiate/adjust, in response to the detected edema indicator, at least one of the cardiac resynchronization therapy that coordinates a spatial nature of a depolarization associated with a heart contraction in at least one heart chamber and the cardiac contractility modulation therapy that includes delivering electrical energy to a portion of a heart during a refractory time period of the portion of the heart.
- 16. (Original)** The system of claim **15**, in which the edema detection circuit includes a thoracic impedance detection circuit.
- 17. (Original)** The system of claim **16**, in which the thoracic impedance detection circuit includes first and second electrodes configured for association with a portion of the subject's thorax.
- 18. (Original)** The system of claim **17**, in which the thoracic impedance detection circuit further includes an averager/lowpass filter to obtain a baseline portion of the thoracic impedance signal associated with the condition correlative to edema.
- 19. (Original)** The system of claim **18**, in which the averager/lowpass filter includes an effective cutoff frequency that is between 0.01 Hz and 0.5 Hz.
- 20. (Original)** The system of claim **19**, in which the cutoff frequency is approximately equal to 0.1 Hz.

21. (Original) The system of claim 17, in which the thoracic impedance circuit further includes a filter circuit to obtain information about the subject's breathing.

22. (Original) The system of claim 15, in which the edema detection circuit provides the condition correlative to edema as determined from both a breathing rate of a subject and a thoracic impedance indication of fluid buildup in the subject's thorax.

23. (Original) The system of claim 15, in which the controller includes a stored interelectrode delay, and in which the controller, in response to the detected edema indicator, adjusts a value of the interelectrode delay.

24. (Original) The system of claim 23, in which the interelectrode delay includes at least one of an atrioventricular delay, an interventricular delay, and an intraventricular delay.

25. (Original) The system of claim 15, in which the controller, in response to the detected edema indicator, selects at least one particular electrode, from a plurality of electrodes differently located in association with a heart of the subject, for subsequent delivery of a contraction-evoking stimulation.

26. (Original) The system of claim 25, in which the controller, in response to the detected edema indicator, selects the particular electrode from a plurality of same-chamber electrodes differently located in association with a single chamber of the subject's heart.

27. (Original) The system of claim 25, in which the controller, in response to the detected edema indicator, selects the particular electrode from a plurality of electrodes, at least two of which are located in association with different chambers of the subject's heart.

28. (Original) The system of claim 15, in which the controller, in response to the detected edema indicator, provides a non-contraction-evoking stimulus to a location of a heart of the subject during a refractory period of the heart location.

29. (Original) The system of claim **28**, in which the refractory period follows a paced or sensed contraction of the heart location.

30. (Previously Presented) A method including:

sensing, in a subject, a condition correlative to edema, the sensing including detecting a decrease in the baseline thoracic impedance associated with fluid buildup in the portion of the thorax of the subject, in which the baseline portion of the thoracic impedance is less than or equal to a cutoff frequency value that is between 0.01 Hz and 0.5 Hz inclusive; and

initiating/adjusting, in response to the sensing, at least one of a cardiac resynchronization therapy and a cardiac contractility modulation therapy.

31. (Previously Presented) The method of claim **30**, in which the cutoff frequency value is approximately 0.1 Hz.

32. (Previously Presented) A method including:

sensing, in a subject, a condition correlative to edema, the sensing including detecting a change in a baseline thoracic impedance associated with fluid buildup in a portion of a thorax of the subject, and in which the sensing also includes detecting an increase in a rate of breathing of the subject from a portion of the thoracic impedance that is approximately between 0.05 Hz and 2.0 Hz inclusive; and

initiating/adjusting, in response to the sensing, at least one of a cardiac resynchronization therapy and a cardiac contractility modulation therapy.

33. (Previously Presented) A method including:

sensing, in a subject, a condition correlative to edema; and

initiating/adjusting, in response to the sensing, a cardiac resynchronization therapy that includes selecting an interelectrode delay value, for subsequent delivery of contraction-evoking stimulations occurring during a single cardiac cycle, wherein the interelectrode delay is selected from a set of delays including interventricular delays and intraventricular delays.

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- 34. (Previously Presented)** A method including:
- sensing, in a subject, a condition correlative to edema; and
- initiating/adjusting, in response to the sensing, a cardiac resynchronization therapy that includes selecting at least one particular electrode, from a plurality of electrodes differently located in association with a heart of the subject, for subsequent delivery of a contraction-evoking stimulation.
- 35. (Previously Presented)** The method of claim **34**, in which selecting the interelectrode delay value includes selecting at least one of an atrioventricular delay value, an interventricular delay value, and an intraventricular delay value.
- 36. (Previously Presented)** The method of claim **34**, in which the selecting the particular electrode includes selecting the particular electrode from a plurality of same-chamber electrodes differently located in association with a single chamber of the subject's heart.
- 37. (Previously Presented)** The method of claim **34**, in which the selecting the particular electrode includes selecting the particular electrode from a plurality of electrodes, at least two of which are located in association with different chambers of the subject's heart.
- 38. (Previously Presented)** A method including:
- sensing, in a subject, a condition correlative to edema; and
- initiating/adjusting, in response to the sensing, a cardiac contractility modulation therapy that includes providing a non-contraction-evoking stimulus to a location of a heart of the subject during a refractory period of the heart location.
- 39. (Previously Presented)** The method of claim **38**, in which the refractory period follows a paced or sensed contraction of the heart location.

40. (Previously Presented) A cardiac rhythm management system including:

an edema detection circuit to sense a condition correlative to edema in a subject, the edema detection circuit including a thoracic impedance detection circuit configured to be coupled to first and second electrodes configured for association with a portion of the subject's thorax, the thoracic impedance detection circuit including an averager/lowpass filter to obtain a baseline portion of the thoracic impedance signal associated with the condition correlative to edema, the averager/lowpass filter including an effective cutoff frequency that is between 0.01 Hz and 0.5 Hz;

an electrical energy delivery circuit to deliver electrical energy to the subject; and
a controller circuit, coupled to the edema detection circuit to receive a detected edema indicator, and coupled to the energy delivery circuit to provide a control signal for timing delivery of the electrical energy to the subject, the controller including a cardiac resynchronization therapy parameter and a cardiac contractility modulation therapy mode, and in which the controller is configured to initiate/adjust, in response to the detected edema indicator, at least one of the cardiac resynchronization therapy and the cardiac contractility modulation therapy.

41. (Previously Presented) The system of claim 40, in which the cutoff frequency is approximately equal to 0.1 Hz.

42. (Previously Presented) The system of claim 40, in which the thoracic impedance circuit further includes a filter circuit to obtain information about the subject's breathing.

43. (Previously Presented) The system of claim 40, in which the edema detection circuit provides the condition correlative to edema as determined from both a breathing rate of a subject and a thoracic impedance indication of fluid buildup in the subject's thorax.

44. (Previously Presented) A cardiac rhythm management system including:

an edema detection circuit to sense a condition correlative to edema in a subject;
an electrical energy delivery circuit to deliver electrical energy to the subject; and
a controller circuit, coupled to the edema detection circuit to receive a detected edema indicator, and coupled to the energy delivery circuit to provide a control signal for timing delivery of the electrical energy to the subject, the controller including a cardiac resynchronization therapy parameter and a stored interelectrode delay, the stored interelectrode delay selected from a set of delays including stored interventricular delays and intraventricular delays, and in which the controller is configured to initiate/adjust, in response to the detected edema indicator, the cardiac resynchronization therapy by adjusting a value of the interelectrode delay.

45. (Canceled)

46. (Previously Presented) A cardiac rhythm management system including:

an edema detection circuit to sense a condition correlative to edema in a subject;
an electrical energy delivery circuit to deliver electrical energy to the subject; and
a controller circuit, coupled to the edema detection circuit to receive a detected edema indicator, and coupled to the energy delivery circuit to provide a control signal for timing delivery of the electrical energy to the subject, the controller including a cardiac resynchronization therapy parameter, and in which the controller is configured to initiate/adjust, in response to the detected edema indicator, the cardiac resynchronization therapy by selecting at least one particular electrode, from a plurality of electrodes differently located in association with a heart of the subject, for subsequent delivery of a contraction-evoking stimulation.

47. (Previously Presented) The system of claim 46, in which the controller, in response to the detected edema indicator, selects the particular electrode from a plurality of same-chamber electrodes differently located in association with a single chamber of the subject's heart.

48. (Previously Presented) The system of claim 46, in which the controller, in response to the detected edema indicator, selects the particular electrode from a plurality of electrodes, at least two of which are located in association with different chambers of the subject's heart.

49. (Previously Presented) A cardiac rhythm management system including:
an edema detection circuit to sense a condition correlative to edema in a subject;
an electrical energy delivery circuit to deliver electrical energy to the subject; and
a controller circuit, coupled to the edema detection circuit to receive a detected edema indicator, and coupled to the energy delivery circuit to provide a control signal for timing delivery of the electrical energy to the subject, the controller including a cardiac contractility modulation therapy mode, and in which the controller is configured to initiate/adjust, in response to the detected edema indicator, the cardiac contractility modulation therapy by providing a non-contraction-evoking stimulus to a location of a heart of the subject during a refractory period of the heart location.

50. (Previously Presented) The system of claim 49, in which the refractory period follows a paced or sensed contraction of the heart location.